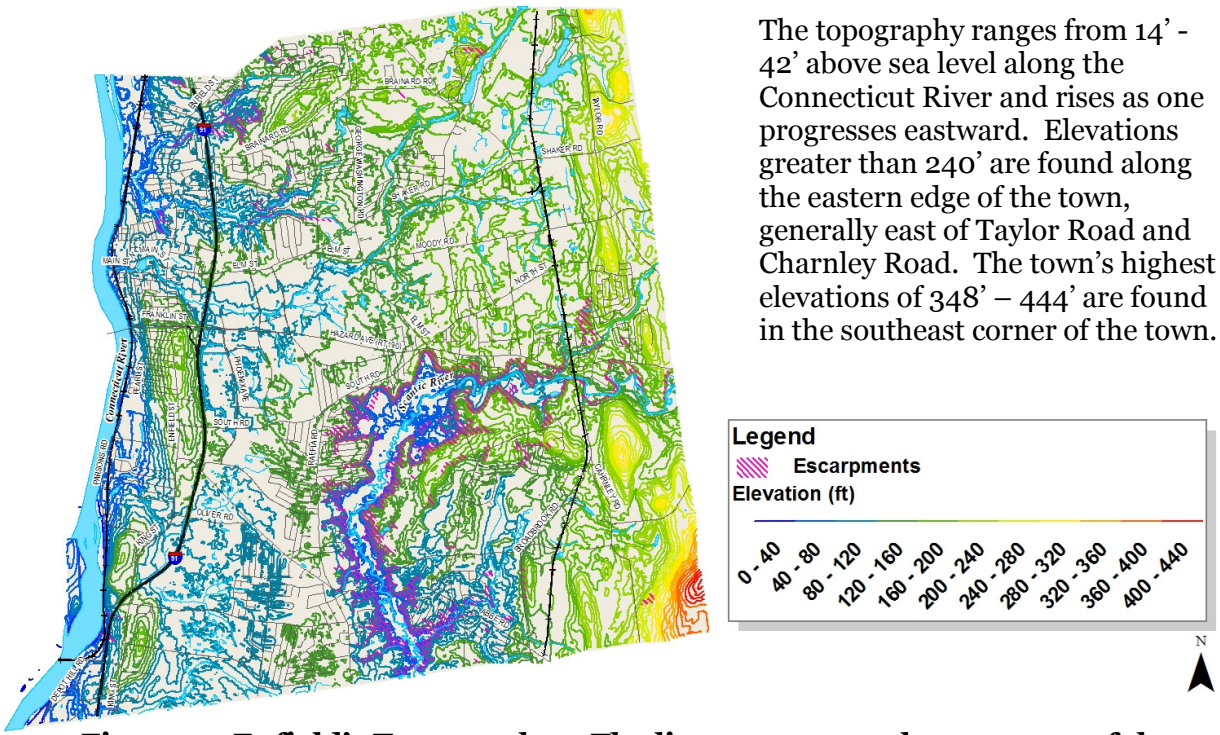
Natural Resources & Climate Change

The natural environment is the foundation upon which communities are built. The purpose of this chapter is to identify the kinds of natural resources that exist in Enfield and determine how they can contribute to the community's vision for the future. The chapter will also examine the condition of those resources and try to shed light on how people's actions and land use decisions can affect their environment. A review of the regulations that govern the use of the town's resources will help to make sure that the goals, objectives, policies and actions of this Plan will be consistent with other local, regional, statewide and national regulations and policies. Most importantly, the information in this chapter will help the Town identify areas that are suitable for development, those that can support limited development, and those that should be protected from development.

Geographic Location

Enfield is a town of approximately 34 square miles in north-central Connecticut, along the border with Massachusetts. The Connecticut River separates Enfield from Suffield to the west. Enfield shares its southern border with East Windsor and Ellington and its eastern border with Somers.

Topography



The topography ranges from 14' - 42' above sea level along the Connecticut River and rises as one progresses eastward. Elevations greater than 240' are found along the eastern edge of the town, generally east of Taylor Road and Charnley Road. The town's highest elevations of 348' – 444' are found in the southeast corner of the town.

Figure 50 Enfield's Topography – The lines represent the contours of the land. Blue contour lines represent lower elevations; reds, higher elevations.

Soils

The Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture (USDA) classifies soils within the US, and compiles the information in "soil surveys". The Soil Survey for Hartford County, Connecticut includes detailed descriptions of the kind of soils present in Enfield, their suitability for different uses, and development constraints. The Soil Survey is particularly useful for land use planning because it describes the soils' suitability for on-site sewage treatment (septic systems) and agricultural use, their susceptibility to erosion, and the presence of wetlands.

Highly Erodible Soils

Several types of soils within the town are highly erodible. These are referred to as "terrace escarpment soils" or "escarpments." Significant erosion problems are associated with these soil types, particularly along the banks of the Scantic River. Escarpment soils are regulated by the "Inland Wetlands and Watercourses Regulations of the Town of Enfield," as are other soils on slopes that exceed 15% and are within 100' of a wetland or watercourse. (See Figure 51 for the location of terrace escarpment soils)

Important Soils for Agriculture

Soil surveys identify the location of prime and important farmland, which is useful to ensure that agricultural activities are on fertile land. It is also useful as a farmland preservation tool to ensure that prime and important farmlands are not lost to industrial and urban uses. Without appropriate planning, agriculture may become relegated to marginal lands, which may be more erodible, droughty, harder to cultivate and less productive.

Of the 82 soil types within the town, 26 soil types (approximately 7,160 acres or 33% of the town) are considered prime farmland, as defined by the USDA. Additionally, 23 soil types (approximately 5,753 acres or 26% of the town) are considered farmland of statewide importance. Approximately 90% of the agricultural land use in the town occurs on land considered prime farmland or farmland of statewide importance.

Water Resources

Watersheds

It is important to consider water resources and management from a wider perspective such as the watershed level because water is not constrained to political boundaries. The Connecticut Department of Environmental Protection (CT DEP) addresses water resource and water quality issues at the watershed level under the umbrella of the Watershed Management Program. The CT DEP has divided the state into five major watershed basins following natural watershed boundaries. A major watershed is further divided into regional, sub regional and local watersheds. Enfield is included within the "Connecticut Area" major watershed, which encompasses central Connecticut; but it is split between two regional watersheds: the Connecticut Main Stem and the Scantic regional watersheds. These watersheds drain respectively to the Connecticut River and Scantic River. See Figure 52 for an illustration of the regional, sub regional and local watersheds within the Town of Enfield.

Connecticut River Watershed

The Connecticut Area watershed is a portion of the greater Connecticut River watershed that is within the state of Connecticut. The greater Connecticut River watershed covers approximately 11,000 square miles within four states, extending from the northern tip of New Hampshire to the Long Island Sound. The Connecticut River flows for approximately 400 miles and provides 70% of all the fresh water entering the Long Island Sound.

From Paleolithic times to today, humans have depended on the Connecticut River watershed. Over 2.3 million people do at present. Interactions with the Connecticut River and its tributaries have ranged from the sustainably benign, to the extremely detrimental. In the 17th century, European settlements and their attendant massive timbering and new farms led to great upheaval in watershed habitats. In less than two centuries a landscape that was 80% forested was transformed into a patchwork-terrain of small woodlots, fields and fences in which trees covered just 20% of the watershed.[156] Modern challenges to the health of the watershed include urban and suburban development, and increasing amounts of impervious surfaces, non-point source pollution, sewage treatment effluent, erosion and siltation, and dams.

The watershed is home to migratory fish and birds, and several threatened and endangered species. It also hosts extensive globally significant tidelands. In 1991, the entire Connecticut River watershed was designated as the Silvio O. Conte National Fish and Wildlife Refuge, the first watershed-wide refuge of its kind in the country. In 1998, the Connecticut River was designated as an American Heritage River, due to its historic and cultural significance to the nation.

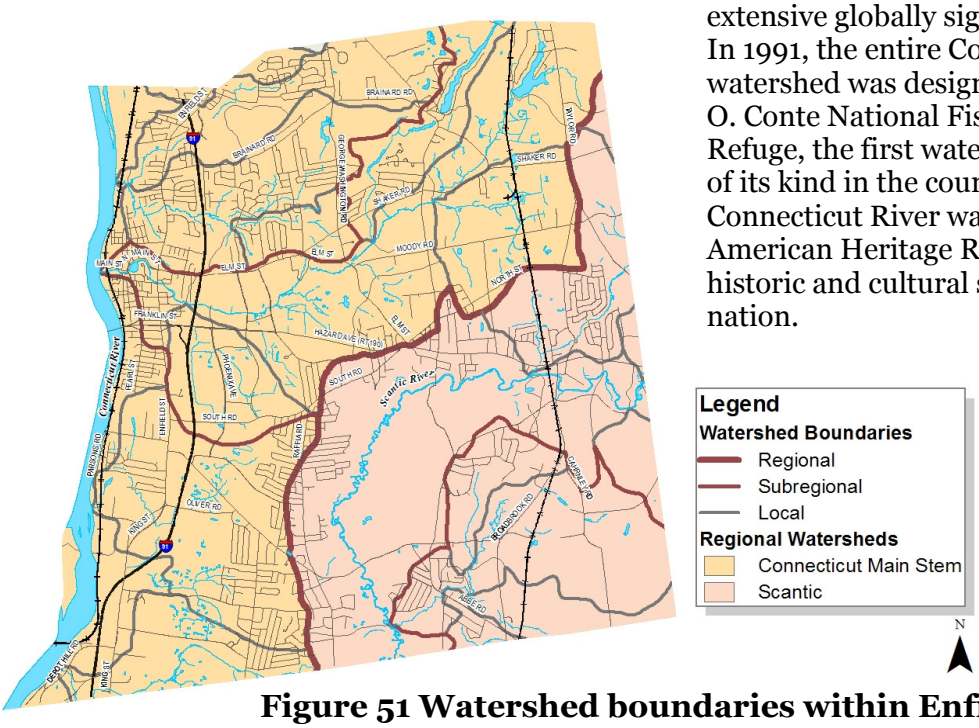


Figure 51 Watershed boundaries within Enfield

Several organizations are active in the stewardship of the Connecticut River watershed. Groups and agencies that are active within the entire 11,000 square mile Connecticut River Watershed include the U.S. Fish and Wildlife Service Connecticut River Coordinator's Office (fishery management and habitat restoration), U.S. Geological Survey's National Water-Quality Assessment (NAWQA) Program's Connecticut, Housatonic and Thames River Basins (CONN)

[156] "The Connecticut and Its Tributaries". Connecticut River Watershed Council. 28 May 2009. <http://www.ctriver.org/our_region_and_rivers/about_our_rivers/index.html>

Study Unit (status and trends in the quality of surface and groundwater resources), and conservation organizations such as the Connecticut River Watershed Council and the Trust for Public Land.

Scantic River Watershed

The Scantic River Watershed covers an area of approximately 90,000 acres between Connecticut and Massachusetts. The Scantic River itself begins in Hampden, Massachusetts, and flows 38 miles to its confluence with the Connecticut River in South Windsor, Connecticut. The river twists and turns through some of the best agricultural lands in the nation.[157] Like the Connecticut River, the Scantic River was a source of food, waterpower and irrigation for early settlers of the area.

A number of groups and government agencies are actively involved in planning for the entire watershed, but some focus on the portions of the watersheds within the Connecticut. The Rivers Alliance of Connecticut is a statewide non-profit organization dedicated to protecting and enhancing Connecticut's rivers, streams, and watersheds. In Enfield and Somers, the Scantic River Watershed Association is active in the stewardship of the Scantic River and its watershed. This group assists the CT DEP in getting volunteers for the agency's annual biostream surveys. Another active organization is the Northern Connecticut Land Trust.

Surface Water

Surface water refers to rivers, streams, ponds and wetlands. The Connecticut River is the largest waterbody in Enfield and it flows along the town's western boundary. The Scantic River meanders through the southeast quadrant of the town. Other named streams include Beemans Brook, Boweyns Brook, Buckhorn Brook, Freshwater Brook, Grape Brook, Jawbuck Brook, Pierce Brook, Raspberry Brook, Rustic Brook, Terry Brook, Waterworks Brook and Woods Stream. Crescent Lake and Shaker Pond, in the northeast section of Enfield, are the town's largest ponds. Other named ponds include Charnley Road Pond, Cranberry Pond, Freshwater Pond, Haas Pond, Melrose Pond, Powder Mill Ponds, Richardson Pond, Stowes Pond, Taylor Pond, Tobacco Pond No. 1 and 2, and Washington Road Pond. Wetlands in Enfield are a result of the area's glacial past and resultant soils and topography. They are scattered throughout the town, many along the Connecticut and Scantic Rivers.

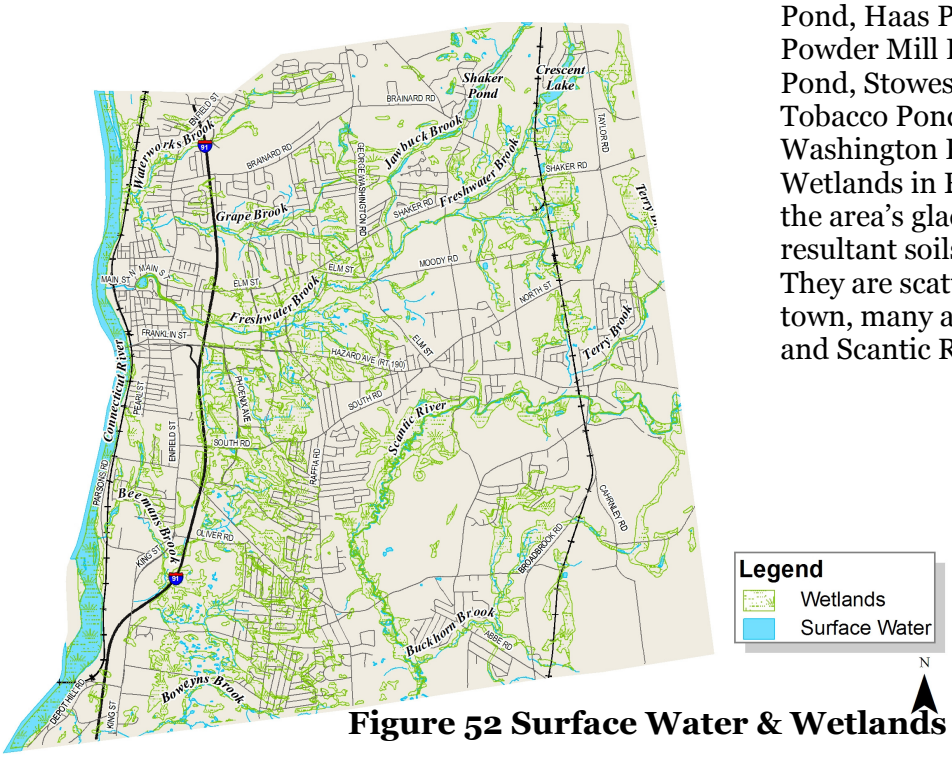


Figure 52 Surface Water & Wetlands

[157] Scantic River Watershed Association. Your Guide to the Scantic River.

Surface Water Quality

The Federal Clean Water Act (CWA) requires each state to monitor, assess and report on the quality of its waters relative to designated uses established in accordance with the state's water quality standards. The CWA is the primary federal law that protects our nation's surface waters, including lakes, rivers, wetlands, estuaries and ocean waters. In authorizing the Act, Congress declared, as a national goal, the attainment, wherever possible, of "water quality, which provides for the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water". This goal is popularly referred to as the "fishable / swimmable" requirement of the CWA.[158]

The CWA requires all states to list the waters that do not meet state water quality standards. A waterbody that does not meet water quality standards is considered to be impaired. When a water body is listed on the Impaired Waters list, the CT DEP describes the cause or probable causes of the impairment. The DEP then determines the degree of priority (high, medium or low) for developing a Total Maximum Daily Load (TMDL) or other pollution control program to address each impairment. A report about the impaired waterbodies is submitted to the EPA every two years. The latest report is the "2008 State of Connecticut Integrated Water Quality Report".

There are no surface waters within Enfield that have TMDLs associated with them. However, a state-wide TMDL concerning the concentration of mercury in fish does apply to Enfield. This TMDL has led to a Statewide Advisory recommending limiting the consumption of freshwater fish due to elevated levels of mercury in some species.

In Enfield, the surface water segments assessed by the CT DEP for the 2008 report were: the Connecticut River, Scantic River, Freshwater Brook and Buckhorn Brook. None of these segments was assessed for aquatic life use, but some were assessed for recreational use. Table 47 lists the findings from that assessment. The Connecticut River is designated as impaired for recreational use and fish consumption. Buckhorn Brook, Freshwater Brook, and the Enfield segment of the Scantic River fully support fish consumption. However, the CT DEP recommends people to refer CT DEP Angler's Guide or the CT DEP website for more information about fish consumption advisories. Neither Freshwater Brook nor the Enfield segment of the Scantic River was assessed for recreational use.

Table 47 Enfield's Impaired Waters

Waterbody	Impaired Designated Use	Cause	Potential source	TMDL Priority Level
Connecticut River	Recreation	Enterococcus Escherichia coli	Combined Sewer Overflows, Municipal Point Source Discharges, Sources Outside State Jurisdiction or Borders, Source Unknown	High
	Fish Consumption	Polychlorinated biphenyls	Municipal Point Source Discharges, Source Unknown, Sources Outside State Jurisdiction or Borders	Low
Buckhorn Brook	Recreation	Escherichia coli	unknown	High

Source: Connecticut Department of Environmental Protection. 2008 State of Connecticut Integrated Water Quality Report.

[158] Connecticut Department of Environmental Protection. August 2008. 2008 State of Connecticut Integrated Water Quality Report. 7 p.

The Connecticut River and Buckhorn Brook's recreational impairments have been given a high priority for developing TMDL plans. This means that the water body is currently under study, and that a TMDL plan may be needed to eliminate the water quality impairment. Pending study results, these waters may be reassigned to another EPA category that does not require a TMDL, or a TMDL plan may be developed within 3 years.

The fish consumption impairment to the Connecticut River has been given a low priority. This means that insufficient information exists to address the impairment in the near future or that other programs may be more effective to remedy the water quality impairment. These waters may be reassigned to another EPA category (one not requiring a TMDL), or a TMDL plan may be developed in 7-11 years.[159]

Groundwater

The Town of Enfield receives its drinking water from groundwater sources. Enfield, as well as the rest of Connecticut, is underlain by two major types of groundwater aquifers:

- **Bedrock aquifers** - Bedrock aquifers underlie the entire state and are an important source of water for self-supplied/non-community domestic, commercial, and industrial users. Bedrock aquifers primarily store and transmit water through intersecting fractures in consolidated rock.[160]
- **Unconsolidated glacial sand and gravel (stratified-drift) aquifers** - Stratified-drift aquifers line the larger river valleys. They are generally the most productive sources of ground water, but they are not evenly distributed. They store and transmit water through interconnected pores between individual grains of sediment. Factors that significantly influence the availability of groundwater include differences in the thickness, extent, and permeability of the stratified-drift aquifers; and the size of surface waterbodies and their proximity to the recharge area. These aquifers are the primary source of groundwater for water utilities that serve populations of greater than 1,000 people.[161]

Connecticut's aquifer systems are shallow, typically less than 300 feet deep, and the water table is within 50 feet of the land surface. Most wells tap the upper part of the saturated zone, producing water that has been in the aquifer for only a few months to a few decades. These shallow aquifers are susceptible to contamination from land use activities on the surface.[162]

Groundwater Quality

CT Source Water Assessment Program (SWAP)

The Department of Public Health (DPH) and the CT DEP manage the state's Source Water Assessment Program (SWAP). This program is mandated under the Safe Drinking Water Act Amendments of 1996, and its purpose is to complete an assessment of wellfields that are sources of public drinking water to evaluate their susceptibility to potential sources of contamination. Sources of potential contamination that are of concern to public drinking water supplies in Connecticut are generally associated with historic waste disposal sites, or commercial,

[159] Connecticut Department of Environmental Protection. August 2008. 2008 State of Connecticut Integrated Water Quality Report. 132 p.
[160] "CONN Study Unit Description". USGS CT Water Science Center. 3 June 2009. <http://ct.water.usgs.gov/nawqa/description.htm>
[161] "Connecticut Groundwater Conditions". Groundwater Protection Council. 3 June 2009. < http://www.gwpc.org/e-library/documents/state_fact_sheets/connecticut.pdf>
[162] "Connecticut Groundwater Conditions". Groundwater Protection Council. 3 June 2009. < http://www.gwpc.org/e-library/documents/state_fact_sheets/connecticut.pdf>

industrial, agricultural and residential properties that store or use hazardous materials like petroleum products, solvents or agricultural chemicals.[163]

A SWAP is used to evaluate the degree to which a wellfield may be at risk from potential sources of contamination. This helps public water supply system managers, public health officials, regional planners, and state and local government set targets and implement measures to enhance source water protection efforts such as routine inspections, protective land use regulations, acquisition of critical land, proper septic system maintenance, and public education. SWAPs analyze the environmental sensitivity of the aquifer recharge or watershed area; potential contaminant sources present in the aquifer recharge or watershed area; and various "Source Protection Factors", which include the presence of local regulations or zoning initiatives to protect public drinking water supplies and how much of the aquifer recharge or watershed area is controlled by the water utility.

The CT DEP completed the evaluation of Enfield's wellfields in 2003. These wellfields are maintained and operated by the Connecticut Water Company and Hazardville Water Company. In general, the sources of contamination that can potentially impact Enfield's wellfields include:

- underground fuel storage tanks,
- improperly maintained on-site septic systems,
- improper waste disposal, or
- commercial/industrial sites that store or use chemicals, or generate hazardous wastes.

For undeveloped areas, a potential risk factor is inappropriate development. In 2003, more than 30% of the land near source water areas was undeveloped, and less than 10% of them were preserved as open space. Specifically, the SWAP revealed that the wellfield in Enfield with the highest susceptibility to contamination is the O'Bready Wellfield, located north of Hazardville. Some of the factors contributing to a high susceptibility rating include:

- several contaminant levels that exceed maximum federal and state contaminant/guidance levels;
- a contaminant release point within the source water area;
- ten percent or more commercial or industrial development in the source water area; and
- very little or no public or private preserved open space lands in the source water area.

Some of the recommendations and source protection opportunities identified by the CT DEP in the SWAP reports include:

- Encourage homeowners to adopt residential best management practices that minimize the use hazardous materials or generation of hazardous waste.
- Proactively work with local officials and developers to insure that only low-risk development occurs within the source water area.
- Encourage residential property owners to conduct scheduled inspections and maintenance of underground fuel storage tanks and on-site septic systems.
- Support and encourage the acquisition of open space land within the source water area.

[163] State of Connecticut Department of Public Health, Drinking Water Division. May 2003. Source Water Assessment Report: An Evaluation of the Susceptibility of Public Drinking Water Sources to Potential Contamination. 1 p.

Aquifer Protection Strategies

Efforts to protect and improve groundwater quality focus on protection of the source water supply, which includes land use regulation and land preservation. This requires coordinated responsibilities shared by the state, municipality, water companies and individuals. Decisions about land use over the next several decades will be particularly significant. Approximately, 70% of the land within an aquifer protection area is developed with commercial, industrial, institutional, residential or agricultural land uses. The Town adopted Aquifer Protection Regulations consistent with the State model regulations in 2007. Detailed mapping for all Aquifer Protection Areas was completed in 2009 and are now part of the Zoning Map for the Town.

Land conservation is a critical tool to protect drinking water sources. It is uniquely effective in preventing the degradation of water quality and can also offer long-term cost savings. According to an EPA study, prevention measures cost communities an average of five times less – and up to 200 times less – than removing contaminants from drinking water. Preliminary findings from a study by the South Central Connecticut Regional Water Authority also indicate that investments in open space protection help contain water treatment costs in Connecticut.[164]

State and federal grant programs are available to assist with open space acquisition for source water protection. The publication "A Toolkit for Communities: Protecting Land to Safeguard Connecticut's Drinking Water" by the Trust for Public Land (TPL) contains more information about grants, local financing options, tax incentives, conservation easements, purchase of development rights, etc. for open space preservation. Groups such as TPL, The Nature Conservancy, American Farmland Trust, and others can provide assistance with technical issues and, in some cases, planning and real estate transfers.

Wetlands

In Connecticut, inland wetlands are defined by soil type, which differs from the federal definition of wetlands. Defining wetlands by soil type allows identification of wetlands even in times of drought, when characteristic wetland indicator plants may not be obvious. Areas disturbed by human activities and no longer in their natural state, may also be classified as wetlands due to their soil characteristics. To be considered a wetland, the soil must have one or some of the following characteristics: poorly drained, very poorly drained, and alluvial and floodplain. However, all floodplain soils are considered wetlands regardless of drainage class.

Wetlands are important because they perform valuable ecological functions. They:

- remove nutrients, pollutants and sediments from surface water runoff;
- recharge water supplies;
- reduce shoreline erosion and flood risks; and
- provide fish and wildlife habitat.

In addition, wetlands provide recreational opportunities, aesthetic benefits, sites for research and education, and commercial fishery benefits. Historically, wetlands have been undervalued because their benefits and environmental functions were not well understood. Many wetlands have been destroyed or are threatened by illegal dumping, filling, dredging, diversion or obstruction of water flow, erection of structures and other uses.

[164] The Trust for Public Land. 2003. A Toolkit for Communities: Protecting Land to Safeguard Connecticut's Drinking Water. 7 p.

Watercourses are defined broadly to mean rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private.[165]

In Enfield, approximately 5,160 acres (or 23% of the town) are classified as inland wetlands or watercourses. Additionally, approximately 6,260 acres (or an additional 28% of the town) falls within the upland review area, which is associated with the wetlands and watercourses permitting process. Approximately 722 acres, or 14% of the inland wetlands and watercourses in Enfield, fall within protected open spaces. Protected open spaces include private land, state- and municipal-owned land, and one land trust holding. Refer to the Inland Wetlands and Watercourses map at the end of this chapter to see the location of protected open space, as defined by the CT DEP Protected Open Space Mapping Project, with respect to wetlands.

Wetland Regulations

Legislation to protect and regulate the use of wetlands exists at the federal, state and local levels of government. In Connecticut, the CT DEP regulates freshwater wetlands and watercourses through the Inland Wetlands and Watercourses Act. The Act is implemented through regulations adopted by municipal inland wetlands agencies that mirror state regulations. In Enfield, these regulations are the "Inland Wetlands and Watercourses Regulations of the Town of Enfield".

The Inland Wetlands and Watercourses regulations require a permit for all "regulated activities" occurring or proposed within wetlands, watercourses, and the associated upland review area. A **regulated activity** is defined as:

a. any operation within or use of a wetland or watercourse involving removal or deposition of material; or

b. any obstruction, construction, alteration or pollution of such wetlands or watercourses, with the exception of certain specified activities.

Upland review areas are defined as:

a. All areas within 100 feet of the boundary of such wetlands and watercourses;

b. All areas within 200 feet of the Connecticut, and Scantic Rivers, Beemans Brook and Freshwater Brook, up stream of Elm Street crossing (excluding tributaries);

c. All areas within 150 feet of the boundary of such wetlands or watercourses from any proposed subsurface waste disposal or drainage system;

d. All slopes with a grade in excess of 25% within 100 feet of the boundary of a wetland or watercourse. The area measured from the toe of the slope to the top of ridge or escarpment shall be considered regulated;

e. All escarpment slopes as identified in the "Soil Survey , Hartford County, Connecticut" (as it may be amended) as "Tc", "Te", "Tg", with grades in excess of 15% within 100 feet of the boundary of a wetland or watercourse. The area measured from the toe of the slope to the top of the ridge or escarpment shall be considered regulated.

Within the upland review areas, any clearing, grubbing, filling, grading, paving, excavating, constructing, depositing, or removal of material and discharging of storm water on the land requires a permit. Non-regulated activities include certain agricultural, residential, water company, maintenance, conservation, and recreational uses of wetlands.

[165] "Inland and Tidal Wetlands". Connecticut Department of Environmental Protection. 10 June 2009. <http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325674&depNav_GID=1654>

In general, the applicant must demonstrate that his/her application is consistent with the purposes and policies of the regulations and that a feasible and prudent alternative does not exist. A permit application may need to include a plan depicting the proposed activity as well as engineering and/or environmental information describing its impacts. The Inland Wetlands agency may approve the application as filed or grant it upon other conditions, including using impact mitigation measures that can:

a. prevent or minimize pollution or other environmental damage,
b. maintain or enhance existing environmental quality, or
c. restore, enhance and create productive wetland or watercourse resources (in that order of priority)[166]

Other Wetland Protection Strategies

In addition to regulations, some of the best protection for wetlands has been provided through acquisition and conservation easements by private and public land protection programs. However, wetlands functions are not necessarily protected if the wetland is located within protected open space. Open space can be protected for many purposes other than aquifer protection, such as natural resource/feature or habitat conservation, non-facility based outdoor recreation.[167] Wetlands will still be affected by land use activities allowed within the open space, as well as by land uses in adjacent areas.

Water Quality

Preserving and improving water quality is vital to Enfield's natural resources. High quality drinking water supplies are critical to public health, and habitat areas are essential to biological diversity. Both drinking water supply and habitat quality depend on the maintenance of water quality at the highest possible level. Additionally, good water quality is necessary for recreation, since contact with polluted water can pose health risks.

Pollution Sources

Many of our most common water quality problems today are related to the activities and living requirements of people. Water quality is affected by both point and non-point pollution sources. Point source pollution originates from a specific place or location, such as a discharge pipe from a factory. Non-point source pollution originates over a widespread area of the landscape and may include:

- malfunctioning septic systems,
- soil erosion,
- leaking underground fuel storage tanks,
- stormwater runoff,
- fertilizers,
- pesticides, and

[166] The Town of Enfield. July 1974, amended February 2005. "Inland Wetlands and Watercourses Regulations of the Town of Enfield". 29 p.
[167] Connecticut Department of Environmental Protection. 2009. Protected Open Space (shapefile metadata: protected_open_space.htm). 1 p.

- road salt.

In Connecticut stormwater runoff from urban areas and construction activities are two of the most significant categories of non-point source pollution.[168] Unlike point source discharges, which are stringently regulated at the state level, comprehensive management of non-point source discharges is more difficult.

Non-Point Sources of Pollution

The CT DEP describes non-point source management as a "challenge" for the CT DEP and for the numerous other agencies, organizations, and individuals working to restore and protect the quality of the state's water resources. The complicating factor is that non-point source pollution is largely the result of dispersed activities that are regulated at the local level. While the federal and state governments are charged with meeting the goals of the federal Clean Water Act and Coastal Zone Management Act and its companion state laws, they do not have the ability to regulate land use or the primary remaining sources of the pollutants that prevent attainment of these goals. One of the biggest challenges to the state NPS Program is building awareness of the connection between land use and water quality, and then providing local land use decision-makers with the tools necessary to guide development in such a way as to minimize impacts to local water resources.

The national program to control non-point source pollution, prescribed by D319 of the Clean Water Act, relies primarily on the voluntary use of best management practices (BMPs) to reduce the impacts of land use on water quality. CZARA D6217 requires the state to have enforceable policies to ensure the implementation of management measures to protect coastal water quality from non-point source pollution.[169] The CT DEP administers the Nonpoint Source Pollution (NSP) Program and the Watershed Management Program, which are designed to identify and reduce sources of nonpoint pollution.

In addition, the state encourages municipalities to consider the goals and policies of the "Conservation and Development Policies Plan for Connecticut" as well as the "The Plan of Conservation and Development for the Capital Region", both of which contain goals and policy recommendations regarding the reduction of non-point source pollution and the protection of water supply areas.

Domestic and Industrial Waste Water

Domestic waste water contains high levels of carbon, nitrogen, phosphorus, some synthetic organic chemicals and heavy metals, all of which can affect aquatic habitat and ground water quality. Nutrients such as nitrogen and phosphorus may stimulate growth of algae in ponds and rivers, leading eventually to declining levels of oxygen and adverse impacts on habitat. Some synthetic organic chemicals and heavy metals are toxic to humans and other organisms. Domestic waste water also contains bacteria and viruses, which may threaten human health if viable microorganisms enter drinking water.

Industrial waste water can have the same contaminants as domestic sewage; however, concentrations of synthetic organic chemicals and heavy metals may be much higher in industrial waste.

The Infrastructure and Utilities chapter of this plan describes Enfield's municipal sewage collection and treatment system, which serves an estimated 95% of Enfield's residential and industrial areas. The rest of the town is served by septic systems. The Connecticut Department

[168] "Nonpoint Source Pollution (NSP) Management." Connecticut Department of Environmental Protection. 3 June 2009. < http://www.ct.gov/CT DEP/cwp/view.asp?a=2719&q=325588&CT DEPNav_GID=1654>

[169] Connecticut Department of Environmental Protection Bureau of Water Management. November 1999. Connecticut Nonpoint Source Management Program. 21 p.

of Public Health regulates the design and installation of septic systems, but these regulations do not require post-construction maintenance, monitoring or inspections. Overflows from municipal wastewater treatment plants during storm events as well as poorly maintained or malfunctioning septic systems can contribute to water quality problems.

Aquifer Protection

The primary challenge facing the quality of a community's water supply is protecting the integrity of the well areas and groundwater aquifers. An aquifer protection area is defined as an area that includes the well field, recharge area and areas of contribution. The area immediately surrounding a well is particularly important. It is from here that groundwater is unnaturally induced to flow towards a well, creating a cone of depression in the water table. The land area that contributes water to the cone of depression is called the well recharge area and it varies in size and shape depending on the type of aquifer tapped and the yield of the well. A typical recharge area of a low-yield residential well can encompass several acres; that of a large-yield community well can be hundreds of acres.[170]

Land use activities within a well recharge area can have significant effects on groundwater quality. Table 48 lists the principal groundwater concerns related to land uses, as identified by the CT DEP. Enfield's zoning code permits commercial, industrial, agricultural and residential land uses within some of the town's designated aquifer protection areas; the risk of contamination from these uses is tempered by the regulations adopted by the Town in 2007 requiring the registration and regulation of existing hazardous uses within the protected areas and not allowing any new uses that are defined as "regulated activities" within the code. Two municipal solid waste sites are also located within Enfield's aquifer protection areas.

Protection of groundwater sources requires coordinated responsibilities shared by the state, municipality and water companies. It involves identification/modeling of the aquifer protection area (also referred to as a wellhead protection area), as well as the development of protective measures.

The CT DEP has established Aquifer Protection Area Program statutes and regulations to protect critical public water supply wells through delineation of the recharge area and establishment of land use controls to minimize potential contamination. Also included are strategic monitoring requirements for aquifer protection areas and a proposed (but not yet implemented) requirement to inventory and regulate agricultural activities in aquifer protection areas.

The aquifer protection land use regulations restrict development of new land use activities that use, store, handle or dispose of hazardous materials and require existing uses of this type to register with either the CT DEP or the local Aquifer Protection Agency. Regulated activities must comply with the best management practices outlined in the regulations. A materials management plan and a stormwater management plan ~~may also be~~ are required for certain regulated activities under the Aquifer Protection regulations.

[170] "Wells". Connecticut Department of Environmental Protection. 9 June 2009. <http://www.ct.gov/dep/cwp/view.asp?a=2685&q=322276&depNav_GID=1654>

Table 48 Principal Groundwater Concerns in Connecticut		
Land Use	**Specific Facilities/Activities**	**Contaminants**
Residential single and multifamily units	Septic systems, fuel storage tanks, workshops, lawns and gardens.	Household chemicals, home and auto fuels, lubricants, paints, cleaners and degreasers, pesticides, fertilizers, and septic system additives.
Agriculture	Manure storage sites, feeding lots, silage pits, equipment maintenance sites, fuel storage tanks, pesticide and fertilizer use.	Primarily releases and run- off of pesticides, fertilizers, animal and plant wastes, fuels lubricants used for equipment maintenance.
Commercial trades and services	Automobile service and repair shops, dry cleaners, machine shops, photo-finishing labs, printers, medical and veterinarian offices, furniture strippers. Floor drains, parking lots, loading docks, underground storage tanks.	Releases of fuels, lubricants, cleaners, degreasers, fertilizers, pesticides, medical wastes, acids, antifreeze solutions, deicing salts, and miscellaneous chemicals.
Industrial manufacturing and processing	Facilities dedicated to the production and fabrication of minerals, metal, wood, textiles, chemical liquids. Energy production, waste disposal, highway maintenance, road salt storage, and chemical storage.	Similar to those found at commercial land uses but in greater quantities and concentrations. The production, use, storage and disposal of many chemicals and wastes.
Waste disposal	Landfills, municipal and industrial waste treatment, storage and disposal facilities, waste processing.	Many solid, liquid, gaseous and radiological wastes, including pathogenic bacteria and viruses.
Source: "Contamination". Connecticut Department of Environmental Protection. <http://www.ct.gov/dep/cwp/view.asp?a=2685&q=322266&depNav_GID=1654>		

Aquifer Protection Regulations in Enfield

The Enfield Planning and Zoning Commission was established as the Town's Aquifer Protection Agency. The Town's "Aquifer Protection Area Regulations" have been adopted as the Town's aquifer protection area land use regulations, consistent with state regulations. These regulations establish provisions for regulating land use activity within the aquifer protection area including: prohibiting certain new activities, registering existing regulated activities, issuing permits for new regulated activities at registered facilities, and administration and enforcement. Although the CT DEP lists agricultural and residential land uses as principal groundwater concerns, this aspect of the state's Aquifer Protection Regulations have not yet been implemented by the CT DEP.

Plans and guidelines to protect aquifers from agricultural activities

Aquifer Protection Regulations have a requirement that any person engaged in agriculture on land located within an aquifer protection area, and whose annual gross sales from agricultural products during the preceding calendar year were $2,500 or greater, is required to submit a farm resources management plan to the CT DEP. A farm resources management plan outlines the implementation of best management practices (BMPs) to address manure management, pesticide management including storage and handling, nutrient management, storage of fuel and oil, and equipment maintenance. However, this aspect of the state's Aquifer Protection Area Program has not been implemented by the CT DEP.

The CT DEP and the US Natural Resource Conservation Service (formerly the US Soil Conservation Service) have developed the "Manual of Best Management Practices for Agriculture: Guidelines for Protecting Connecticut's Water Resources", which describes a wide range of management practices designed to reduce the impact of agriculture on surface water and ground water quality. The manual was developed to provide guidance in the development of farm resources management plans. The recommended BMPs in the manual are voluntary, except where they become part of an approved farm resources management plan. The CT Department of Agriculture's Environmental Assistance Program (EAP) allows for the reimbursement of part of the costs to maintain compliance with an approved agricultural waste management plan.

Guidelines for protecting aquifers from residential and commercial uses

Activities conducted at a residence "without compensation" are not regulated by the state or local Aquifer Protection Area regulations. The CT DEP website lists some non-regulatory ways that municipalities and the public can reduce the risk of groundwater contamination at home or at work:

- Consider important aquifers when acquiring open space.
- Ensure that town facilities practice good pollution prevention.
- Mount a public education campaign on groundwater risks:
    - how to properly handle and dispose of chemicals;
    - the importance of how to acquire, by purchase or bequest, a critical well recharge area;
    - the proper use and maintenance of septic systems, including the need to routinely pump and inspect septic systems (every five years).
- Conduct regular household hazardous materials collection days.
- Ensure that both commercial and residential oil storage tanks are maintained.
- Test underground fuel oil tanks for leaks; if possible, replace them above ground.
- Encourage the sensible use, storage and disposal of commercial and residential pesticides and fertilizers, chemicals and fuels:[171]
- Reduce the use of chemicals and substitute with safer choices; always use according to directions.
- Properly dispose of all waste; don't dump chemicals down drains or on the ground.

Stormwater, Erosion and Sedimentation

During a rain event, rainwater soaks into the ground or runs across it; the latter is termed stormwater runoff. As areas become more developed, a larger amount of stormwater runs off of paved surfaces, roofs, compacted soils and lawns, rather than soaking into the ground. The loss of wetland and vegetated floodplain areas to development also reduces stormwater's natural ability to soak into the ground. Wetlands and vegetated floodplain areas slow the speed of flowing water and provide infiltration and storage, while larger stormwater flows from developed areas are directed into stormwater drains and local waterways, resulting in greater flow volumes and higher velocities than in the past. Large, fast stormwater flows within streams

[171] "Understanding Groundwater: Protecting a Natural Resource". Connecticut Department of Environmental Protection. 9 June 2009. <http://www.ct.gov/dep/cwp/view.asp?a=2685&q=322272&depNav_GID=1654>

and creeks cause erosion and degradation of riparian habitat and stream banks. Stormwater carries with it sediment, as well as other pollutants including fertilizers, pesticides, road salt, oil, heavy metals, and pathogenic bacteria and viruses.

Stormwater Problems in Enfield

Enfield has experienced on-going erosion problems, particularly of the terrace escarpment soils. In order to address current erosion and drainage problems in Enfield, the town assembled a work group in November 2007. The work group inventoried, prioritized, prepared general cost estimates and established a funding strategy for erosion, flooding and drainage problem areas. As a result, several problem areas have been successfully mitigated or repaired, and many are in the planning stages. However, as the group pointed out in their project, erosion is on-going and these projects are repairing the effects, not addressing the causes. Increased development has resulted in higher stormwater flows and, prior to the 1970s, site drainage design did not require stormwater detention for controlling post-development peak flows; these issues are at the root of many of the erosion and drainage problems. Furthermore, a majority of the stormwater detention facilities throughout the state have been designed to control peak flows, without regard for water quality mitigation. Therefore, drainage, flooding, and erosion problems are common in many older developed areas of the state and many existing stormwater detention basins provide only minimal water quality benefit.[172]

Federal & State Stormwater Regulations

Stormwater management can help reduce some of the problems associated with stormwater runoff. The National Pollution Discharge Elimination System (NPDES) Phases I and II, implemented by the US Environmental Protection Agency (EPA), requires states to regulate the control of polluted discharges from large construction sites, certain industrial activities and operators of municipal separate storm sewer systems (MS4s). The requirements include the establishment of a stormwater management program that is intended to improve water bodies by reducing the quality of pollutants that can enter storm sewer systems during storm events. It also requires the use of best management practices (BMPs) intended to reduce the negative impacts of stormwater. The CT DEP implements the NPDES requirements through its stormwater permitting processes, which applies to the following activities:

1. The Stormwater Associated with Industrial Activities General Permit requires industrial facilities to cover or remove materials whose exposure to precipitation could produce polluted stormwater.
2. The Stormwater Associated with Construction Activities General Permit, requires developers and builders to implement stormwater management plans that will prevent the movement of soil and sediments off construction sites and into nearby streams and water bodies.
3. The Stormwater Associated with Commercial Activities General Permit, found only in Connecticut, requires operators of large paved commercial sites such as malls, movie theaters, and supermarkets to undertake actions such as parking lot sweeping and catch basin cleaning to keep stormwater clean before it reaches water bodies.
4. The Stormwater from Small Municipal Separate Storm Sewer Systems General Permit, only recently implemented in Connecticut, requires each municipality to take steps to keep the stormwater entering its storm sewer systems clean before entering water bodies. One important element of this permit is the requirement that towns implement public education programs to make residents aware that

[172] Connecticut Department of Environmental Protection. 2004. 2004 Stormwater Quality Manual. 10-2 p.

> stormwater pollutants emanate from many of their everyday living activities, and to inform them of steps they can take to reduce pollutants in stormwater runoff.[173]

As a designated MS4 community, Enfield holds a Stormwater from Small Municipal Separate Storm Sewer Systems General Permit. One important element of this permit is the requirement that towns implement public education programs to make residents aware that stormwater pollutants emanate from many of their everyday living activities, and to inform them of steps they can take to reduce pollutants in stormwater runoff.

NPDES requirements are also addressed by the state through the Connecticut Guidelines for Soil Erosion and Sediment Control, which provides guidance on the measures necessary to protect the state's waters from the adverse impacts of stormwater runoff during construction activities and post-construction, respectively.

An integral element of NPDES requirements is an erosion and sedimentation control (E&S) plan, which must include methods and techniques for minimizing erosion and sedimentation from stormwater runoff during construction, based on the best currently available technology. Minimum requirements for E&S plans are mandated under the Connecticut Soil Erosion and Sediment Control Act. This law specifically requires local planning and zoning commissions to consider erosion and sediment controls and provide for certification that an adequate E&S plan has been submitted. Many municipal planning and zoning commissions, including Enfield's, have cited the Connecticut Guidelines for Soil Erosion and Sediment Control in their regulations and frequently require them as the standard to follow.

State Guidelines for Stormwater Management

More sustainable methods of stormwater management, such as on-site bioretention, constructed wetlands and permeable paving, as well as the preservation/restoration of wetlands and floodplain areas can help address the causes of these erosion and flooding problems. The CT DEP's "Stormwater Quality Manual" provides guidance on measures to protect waters from the adverse impacts of post-construction stormwater runoff. The manual focuses on site planning, source control and stormwater treatment practices, and it is intended to be used as a planning tool and as a design guidance document. For those planning new development, the manual provides guidance on source control and treatment measures as well as the preparation of a site stormwater management plan.

For existing development, Chapter 10 of the manual addresses stormwater retrofits, which are designed to reduce peak stormwater flows and improve water quality mitigation functions of, older, poorly designed or poorly maintained stormwater management systems. The chapter presents methods for reducing runoff and improving the treatment of stormwater from existing detention basins, parking lots and highway right-of-ways. It also provides sources for more information on stream restoration practices, including stream bank stabilization of eroded areas and placement of habitat improvement structures.

Local Stormwater Regulations

In conformance with the Connecticut Soil Erosion and Sediment Control Act, Section 7.20 of the Enfield Zoning Ordinance requires the preparation of a soil erosion and sediment control plan for development where the cumulative disturbed area is greater than ½ acre, with the exception of a single family dwelling outside of a subdivision. In Enfield, a developer or contractor must get a permit for the discharge of stormwater directly from CT DEP. The Town does not have any stormwater regulations in addition to the CT DEP regulations.

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[173] "Stormwater Management: How Is Stormwater Regulated?" Connecticut Department of Environmental Protection. 4 June 2009. <http://www.ct.gov/dep/cwp/view.asp?a=2721&q=325702&depNav_GID=1654>

Flooding

Floodplains are located in lowland areas adjacent to watercourses and are subject to flooding both seasonally (as in the case of a spring freshet) and sporadically (as in the case of a major flood). Left undeveloped, floodplains safely store and convey downstream flood waters and receive sediments eroded from elevated areas of the watershed. Floodplains provide fertile soils and they have been used for growing crops since colonial times. When no longer farmed, floodplains revert to floodplain forests.[174] FEMA Flood Insurance Rate Maps are a good indication of where flood zones are located within a particular community.

Since there is no distinct flood season in Connecticut, major riverine flooding can and has occurred in every month of the year. However, the spring snowmelt, and late summer/early autumn hurricanes and tropical storms are periods when riverine flooding is more likely.[175] According to the CT DEP's Natural Hazards Mitigation Plan, major flooding of Connecticut's small rivers and loss of several lives can be expected once every five to ten years during the 21st century. Major flooding of the larger rivers (Housatonic, Connecticut, Farmington) with some loss of life and several hundred million dollars in damage can be expected once every 30 years on average. Since the passage of flood regulations in 1968, and the creation of The Federal Emergency Management Agency (FEMA) in 1978, flood vulnerability in Connecticut has continued to increase but at a slower rate than it would have in the absence of regulation.

Flood Protection Programs

National Flood Insurance Program

FEMA manages the National Flood Insurance Program (NFIP). Enfield, along with nearly 20,000 other communities across the United States and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the Nation's floodplains and floodways. Mandatory flood insurance purchases apply for developments within zones designated as 100-year floodplain. Additionally, communities are required to adopt local land use regulations consistent with federal requirements for construction in these zones. The figure below shows the extent of the 100-year flood zones in Enfield.

Local Floodplain Regulations

Floodplains are important for the storage and conveyance of floodwater. Therefore, it is necessary to manage the types of development that may occur within these areas. The "Inland Wetlands and Watercourses Regulations of the Town of Enfield" requires a permit for regulated activities within floodplains. Additionally, the Town of Enfield Zoning Regulations include conservation overlay zone. Regulations for this zone provide standards for the preservation and usage of lands within the Connecticut River conservation zone, which includes the river floodplain. Per the regulations, flood plain use is regulated so as to preserve the necessary flood storage capacity; to promote public health, safety and general welfare through minimizing flood losses in flood plain areas; and to promote flood plain uses that are compatible with beneficial flood plain functions. The regulations describe uses that are compatible or incompatible with

[174] "Inland Wetlands Management". Connecticut Department of Environmental Protection. 10 June 2009. <http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325684&depNav_GID=1907>

[175] Connecticut Department of Environmental Protection. 2007. Natural Hazards Mitigation Plan for 2007-2010. 2-17 p.

flood plain values. Agricultural or farming uses, excluding farm buildings and farm structures are permitted within the floodplain.

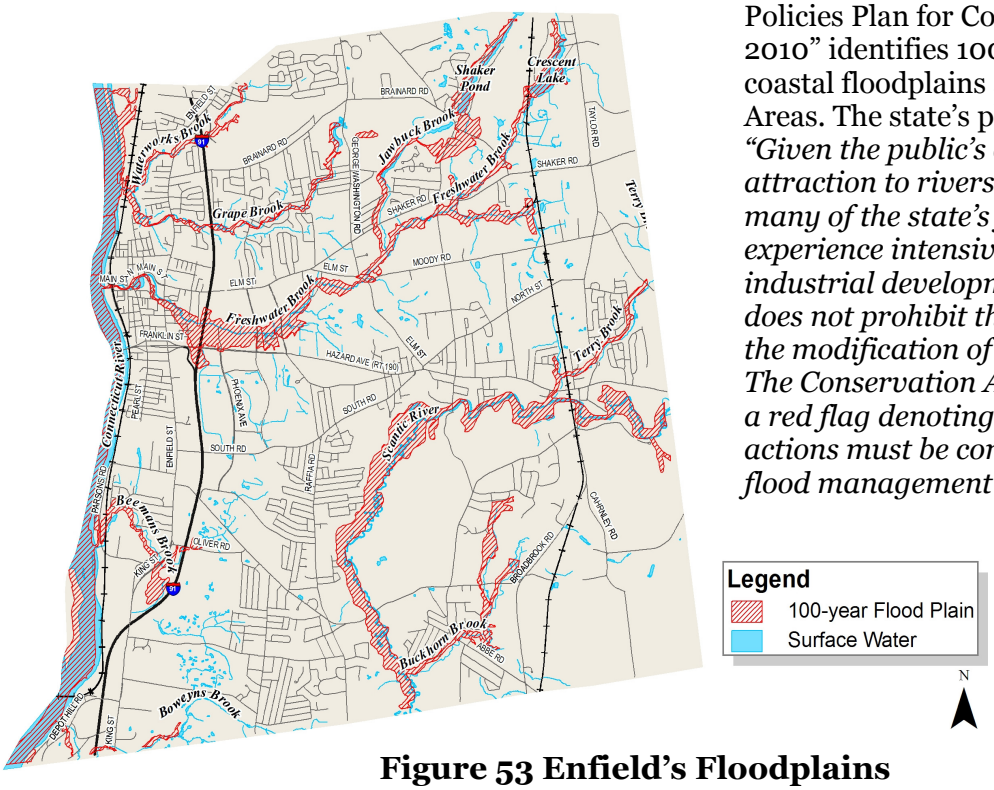


Figure 53 Enfield's Floodplains

"The Conservation and Development Policies Plan for Connecticut 2005-2010" identifies 100-year river and coastal floodplains as Conservation Areas. The state's plan explains, *"Given the public's continued attraction to rivers and the coastline, many of the state's flood hazard areas experience intensive commercial and industrial development. The Plan does not prohibit the continuation or the modification of these land uses. The Conservation Area designation is a red flag denoting that future actions must be consistent with the flood management objectives for such an area."*[176]

Plants & Wildlife

Conservation Strategies

State Comprehensive Wildlife Conservation Strategy

The CT DEP published Connecticut's Comprehensive Wildlife Conservation Strategy. The purpose of the document is to reverse the decline of wildlife populations and the loss of key habitats. Its goal is to keep common species common and minimize the need to list additional species as endangered or threatened.

The Strategy identifies species of greatest conservation need (GCN) and their key habitats. Altogether, there are 475 species of greatest conservation need, including 27 mammals, 148 birds, 30 reptiles and amphibians, 74 fish and 196 invertebrates. GCN species are associated with 12 key habitats and 43 sub-habitats located throughout Connecticut. Each of these habitats, which are considered habitats of greatest conservation need, are linked to standardized state, regional and national vegetation classification systems. GCN habitats and sub-habitats include several types of forests, wetlands, and other unique communities such as sparsely vegetated areas, caves, and coastal beaches. (See the Natural Diversity map at the end of this chapter)

[176] Connecticut Office of Policy and Management Intergovernmental Policy Division. The Conservation and Development Policies Plan for Connecticut 2005-2010. 7p.

Finally, the Wildlife Conservation Strategy summarizes the threats to key habitats and GCN species, and lists the priorities for conducting the research, survey and monitoring, and conservation actions needed to reduce the threats. The most significant threats to Connecticut's land and waterscapes include habitat loss, degradation, and fragmentation caused by development; changes in land use; and competition from non-native, invasive species.[177]

Endangered Species Regulations

The Connecticut Endangered Species Act recognizes the importance the state's plant and animal populations and the need to protect them from threats that could lead to their extinction. The overall goal of the legislation is to conserve, protect, restore and enhance any endangered or threatened species and their essential habitat. Species are listed according to their level of risk, and their status is reviewed every five years.

"Endangered Species" means any native species documented by biological research and inventory to be in danger of extirpation throughout all or a significant portion of its range within the state and to have no more than five occurrences in the state, and any species determined to be an "endangered species" pursuant to the federal Endangered Species Act.

"Threatened Species" means any native species documented by biological research and inventory to be likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range within the state, and to have no more than nine occurrences in the state. It includes any species determined to be a "threatened species" pursuant to the federal Endangered Species Act, except for such species determined to be endangered by the Commissioner in accordance with section 4 of this act.

"Species of Special Concern" means any native plant species or any native non-harvested wildlife species documented by scientific research and inventory to have a naturally restricted range or habitat in the state. It could also be a species that is at a low population level, or is in such high demand by man that its unregulated taking would be detrimental to the conservation of its population or has been extirpated from the state.[178]

The number of endangered, threatened and special concern species in Enfield is significant. The CT DEP's website provides a list of endangered, threatened and special concern species by county, (http://www.ct.gov/dep/cwp/view.asp?a=2702&q=323474&depNav_GID=1628), but does not provide listings by town because, as a CT DEP representative explained, the inventory is not static and may not be complete either. The CT DEP recommends reviewing the CT DEP's Natural Diversity Database (NDDB) maps, which are available online and updated every six months, to identify if a proposed project may impact.

The NDDB maps represent approximate locations of endangered, threatened and special concern species and significant natural communities in Connecticut. The maps are intended to be a pre-screening tool to identify potential impacts to state-listed species and can be used to identify areas of potential conservation concern. Per the CT DEP, a project may have a conflict with a species or natural community if any part of the project: is within an identified NDDB area; overlaps a lake, pond, or wetland that intersects a NDDB area; or is upstream or downstream (by less than 1/2 mile) from a NDDB area. If any of these conditions exists, the CT

[177] Connecticut Department of Environmental Protection Bureau of Natural Resources. October 1, 2005. Connecticut's Comprehensive Wildlife Conservation Strategy. xii-xiii p.

[178] "Endangered, Threatened and Special Concern Species in Connecticut". Connecticut Department of Environmental Protection. 29 July 2009.
<http://www.ct.gov/dep/cwp/view.asp?a=2702&q=323486&depNav_GID=1628&depNav=|>

DEP should be contacted for more information.[179] The figure entitled, Natural Diversity – Areas of Concern shows the location of the NDDB areas within Enfield and the relation of these sensitive areas to protected open space; only a very small portion of NDDB areas fall within existing protected open space.

Farmland

"Farmland is also an integral part of Connecticut's living landscape. Well-managed farms provide habitat for wildlife, filter drinking water, help reduce flooding events, and offset carbon emissions into the atmosphere."[180]

Agricultural land in the region is valued for its contribution to the rural atmosphere and open space.

The USDA National Agricultural Statistics Service conducts the Census of Agriculture every five years. The most recent censuses were conducted in 2002 and 2007. The USDA released the 2007 data in February 2009. However, the 2007 data is only broken down as far as the county level. The 2002 data provides information down to the zip code level. Within the Enfield 06082 zip code, the 2002 Census of Agriculture identified 38 farms, 25 of which were identified as having harvested cropland. There are approximately 3,961 acres of land in agricultural use in the town.

Soils Suitable for Farming

As mentioned in the Soils section of this chapter, the USDA Soil Survey identifies soil types that are considered prime farmland or farmland of statewide importance. Identification of prime and important farmland is useful to land use planning; when prime and important farmlands are lost to industrial and urban uses, agriculture becomes relegated to marginal lands which may be more erodible, droughty, less productive, or less easily cultivated.

Of the 82 soil types within the town, 26 types (approximately 7,160 acres or 33% of the town) are considered prime farmland, as defined by the USDA. Additionally, 23 types (approximately 5,753 acres or 26% of the town) are considered farmland of statewide importance. Approximately 90% of the agricultural land use in the town occurs on land considered prime farmland or farmland of statewide importance.

Farmland Preservation Programs

The CT Department of Agriculture (DOAG) maintains a Farmland Preservation Program, which preserves farmland by acquiring (through donation or purchase) development rights to agricultural properties. Through the voluntary program, the farms remain in private ownership and continue to pay local property taxes and a permanent restriction on nonagricultural uses is placed on these properties. The main objective of the Farmland Preservation Program is to secure a food and fiber producing land resource base, consisting primarily of prime and important farmland soils, for the future of agriculture in Connecticut.

The DOAG has a statewide goal of preserving 130,000 acres, with 85,000 acres of cropland; as of December 2008, the program has preserved 34,500 acres on the 254 farms constituting

[179] "GIS Data Guide, Natural Diversity Database". Connecticut Department of Environmental Protection. 29 July 2009. <http://www.ct.gov/dep/cwp/view.asp?a=2698&q=323102>

[180] State of Connecticut Food Policy Council and the Working Lands Alliance. A Call To Farms! A Mid-decade Look at Connecticut's Agricultural Lands. 2005.

approximately 26% of the 130,000 acre goal. This land base will enable Connecticut to produce at least 50% of its fluid milk needs and 70% of its in-season fresh fruits and vegetables.[181]

Within Enfield, there are 843 acres of land in the Farmland Preservation Program (21% of the agricultural land use). The Farmland map shows the relationship between agricultural land use, prime and important farmland soils and preserved farmland.

Agricultural production is concentrated in several priority watersheds around the state, including the upper Housatonic River basin, the upper Thames River basin, including the Shetucket, Quinebaug, and Yantic river watersheds, and the upper Connecticut River, including the Scantic and Farmington river watersheds.

These areas have been targeted for Environmental Quality Incentives Program (EQIP) and Wildlife Habitat Improvement Program (WHIP) funding.[182] EQIP, a USDA program, provides cost sharing for agricultural improvements that will help meet water quality and other environmental objectives. WHIP is a voluntary program of the USDA NRCS, which provides technical and cost-share assistance to establish and improve fish and wildlife habitat on primarily private land; focus areas are grasslands, riparian areas, old fields, streams, rivers, wetlands, and invasive species management.

Protected Open Space

Definition of Open Space

By definition, Connecticut's Protected open space does not include land for which the Department of Agriculture has acquired development rights. The preserved farmland remains in private ownership and these lands are not generally available to the public for use without further agreement from the individual farm owner. Without a specific public access/recreation or wildlife habitat component, these lands cannot be counted towards the 21 percent open space goal.[183]

Land Protection at the State Level

To gain a better understanding of how much land is actually protected, the CT DEP began the Protected Open Space Mapping (POSM) Project to inventory all open space parcels in the state. The POSM for Enfield was just completed in 2009. The Protected Open Space shown on various maps in this Town of Enfield POCD is derived from data from the POSM. Based on this data, there are 1,574 acres of protected open space in Enfield (7% of the town). The CT DEP owns 21% of this protected open space and the remaining 79% is protected through partners (Town of Enfield, Northern Connecticut Land Trust, water companies, etc.). To achieve 21% protected open space within Enfield by 2023, approximately 3,150 additional acres would need protection (although the 21% is a statewide goal and may not be dispersed equally throughout the state's municipalities).

The land protection process can occur through donation or purchase in several ways, most commonly through fee simple, easements for access, use and/or conservation, or acquisition of

[181] "Farmland Preservation Program". Connecticut Department of Agriculture. 28 July 2009. <http://www.ct.gov/doag/cwp/view.asp?a=3260&q=399016>

[182] Connecticut Department of Environmental Protection Bureau of Water Management. November 1999. Connecticut Nonpoint Source Management Program. 11 p.

[183] Connecticut Department of Environmental Protection. September 2007. The Green Plan: Guiding Land Acquisition and Protection in Connecticut. 13 p.

development rights. The CT DEP has two programs available to assist in realizing the open space acquisition and preservation vision and goal:

- The **Recreation and Natural Heritage Trust Program** – used to acquire lands to add to the State's system of parks, forests, and wildlife, fishery and natural resource management areas for the beneficial use and enjoyment of the public.
- The **Open Space and Watershed Land Acquisition Grant Program** - provides financial assistance to municipalities and nonprofit land conservation organizations to acquire land for open space and to water companies to acquire land to be classified as Class I or Class II water supply property. The grant program stipulates that the acquired land must be protected by a permanent conservation easement requiring that the property remain forever predominately in its natural and open condition. Qualified municipalities can use grant monies for restoration or protection of natural features or habitats on open space already owned by the municipality.

The Green Plan

The CT DEP envisions a diverse landscape of protected open space that offers outdoor recreation to Connecticut's citizens, protects water supplies, preserves natural communities and habitats for plants and animals, offers green spaces accessible to all residents, whether residing in urban, suburban or rural communities, and provides a working natural landscape for the harvest of farm and forest products.[184]

State goals for the acquisition and protection of open space are outlined in The Green Plan: Guiding Land Acquisition and Protection in Connecticut. A statutory goal of protecting 21% of the state's land areas (673,210 acres) by 2023 has been established. Of this 21%, 10% is targeted to be acquired and held by the state and 11% is targeted to be acquired and held by land protection partners. Partners are identified as municipalities, nonprofit land conservation organizations, water companies, and interested private property owners.

Consistency with Other Plans

This goal of protecting open space complements other state and local plans, such as the Conservation and Development Policies Plan of Connecticut 2005-2010, several CT DEP plans (including the Climate Change Action Plan for Connecticut; Connecticut Comprehensive Wildlife Conservation Strategies; Natural Hazards Mitigation Plan; Connecticut Recreation Trails Plan; and the Statewide Comprehensive Outdoor Recreation Plan, each discussed in this Town of Enfield POCD), A Plan of Conservation and Development for the Capital Region, and this Town of Enfield Plan of Conservation and Development.

Green Plan's Priorities for Acquisition

Besides setting acquisition/protection targets, The Green Plan also identifies priorities for acquisition and protection: three categories of land qualities that should be evaluated with each potential land protection project. These are the *ecological values* of the property, the *uses that the property can provide or protect*, and the *location of the site*.

For *ecological value*, properties containing sensitive ecological communities, outstanding or representational examples of ecological communities or certain water resources, as listed in The Green Plan, will receive higher scores during evaluation; for example in Enfield, these may

[184] Connecticut Department of Environmental Protection. September 2007. The Green Plan: Guiding Land Acquisition and Protection in Connecticut. 1 p.

include streams/rivers and associated riparian communities, upland buffers around high quality wetlands, riverine islands, steep slopes, erodible soils, etc.

In addition to protecting ecological value, the DEP will work to protect properties that can provide certain *uses* that benefit the public, such as habitat that supports one or more species of greatest conservation need, floodplain protection, riparian buffers, properties that provide recreational or cultural heritage opportunities, etc.

Thirdly, the relative *location* of a property is considered; there are certain site-specific conditions that can enhance the value of a potential acquisition or protection opportunity, such as proximity/linkages to existing open space or greenways, threat of development, parcels that may further environmental justice/environmental equity goals, etc.

Conservation and Development Plans

The state's Conservation and Development Policies Plan of Connecticut 2005-2010 (State C&D Plan) and A Plan of Conservation and Development for the Capital Region both support open space preservation.

The State C&D Plan identifies and maps Preservation Areas, which can help the state attain its goal of 21% protected open space. In Enfield, these Preservation Areas include rivers, lakes, ponds, wetlands, locations of state Threatened, Endangered or Special Concern species, etc.

The Capital Region plan identifies Conservation Corridors, which are areas that link sensitive and preserved land in order to protect significant natural features across municipalities; according to the Capital Region plan, permanent preservation of land in these corridors is of "high regional importance". In Enfield, the Capital Region plan identifies Conservation Corridors along the Connecticut and Scantic Rivers.

Climate Change

The pattern of weather in a particular place is its climate. Climates vary slowly over time, forcing life to adapt to new conditions, but recently the rate of climate change has sped up. Global average temperatures started rising around 1900. They have risen and fallen many times since then, but the trend has crept upward – slowly at first, but more rapidly since the 1970s. The rise in temperature roughly matches the rise of modern industry, the growth of huge cities, and the increasing quantities of fuel such as coal and oil that we burn to provide energy for heating, electrical power, and transportation.[185] The United Nations Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment, released in 2007, concludes that it is "unequivocal" that the climate is warming and that there is "very high confidence" (i.e., at least 90% certainty) that human activities have caused "most of the observed increase in globally averaged temperatures since the mid-twentieth century."[186]

Causes of Climate Change

Scientists have learned that climate change is caused by a combination of factors, some natural and some caused by human activity. The most significant of factors is the increase in greenhouse gases in the atmosphere, especially carbon dioxide.

The greenhouse effect is the rise in temperature that the Earth experiences because certain gases in the atmosphere (water vapor, carbon dioxide, nitrous oxide, and methane, for example) trap

[185] Woodward, John. Eyewitness Climate Change. New York: DK Publishing, 2008. 6-7 p.
[186] "An Introduction to Climate Change". Connecticut Climate Change. 11 June 2009. <http://ctclimatechange.com/climate_change.html>

energy from the sun. Without these gases, heat would escape back into space and Earth's average temperature would be about 60˚F colder. Because of how they warm our world, these gases are referred to as greenhouse gases.[187]

The increase in carbon dioxide has added significantly to the greenhouse effect that keeps the planet warm; this is one of the main reasons why global temperatures are rising. Most of the extra carbon dioxide is released by the burning of carbon-rich fuels. Trees, plants and organisms sequester, or store, carbon when they absorb carbon dioxide during their growth process. When wood is burned for fuel or trees are cut and burned to clear land for farming, ranching, road building and homes, the carbon that the trees have stored over their lifetimes is released as carbon dioxide. Fossil fuels, such as oil, gas and coal, have formed slowly over millions of years; these fuels contain carbon from living things that died and were buried and compressed before they had a chance to decay. The burning of fossil fuels releases the carbon, in the form of carbon dioxide that was stored by the plants and organisms as they grew long ago. The burning of fuels releases carbon dioxide into the atmosphere at a much faster rate than it can be soaked up by the processes that formed the fuel in the first place, so the concentration of carbon dioxide in the air increases.[188]

Climate change is a global problem and requires global action. Gradually, international agreements are being forged to combat climate change. But in order to effectively achieve results, changes in policy and behavior are required at the national, state, local and individual levels.

Effects of Climate Change

Steadily rising global temperatures can have serious consequences, such as heat waves, droughts, wildfires, more intense storms, floods, melting glaciers, and rising sea levels. Fragile natural environments will suffer. Plants and animals that cannot cope with the changes in climate and habitat may eventually become extinct, while other organisms may flourish as they adapt. The result is a new mix of species that suits an altered world. This process enabled mammals to take over when dinosaurs became extinct 65 million years ago. Recent wildlife losses may be signaling that we are at the beginning of a similar process now.

Climate change can also have a big impact on society. In some areas of the world, climate change could affect famines, mass migrations and conflicts over land and resources. Developed countries, such as our own are vulnerable to loss of services such as power, communications and transportation, as a result of destructive events (similar to what happened with Hurricane Katrina in New Orleans in 2005). Scientists fear that if we do not make every effort to combat climate change, global temperatures could rise high enough to trigger catastrophic events like mass melting of the Arctic permafrost and huge wildfires, which would release more greenhouse gasses and further accelerate global warming.[189]

[187] "Greenhouse Effect…" United States Environmental Protection Agency. 4 August 2009. <http://www.epa.gov/climatechange/kids/greenhouse.html>

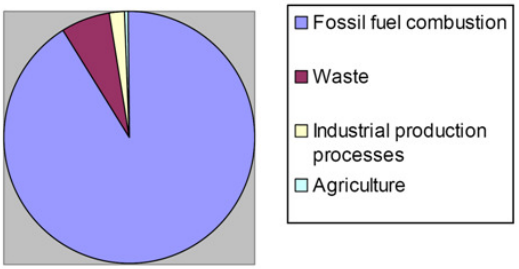
[188] Woodward, John. Eyewitness Climate Change. New York: DK Publishing, 2008. 21 p.

[189] Woodward, John. Eyewitness Climate Change. New York: DK Publishing, 2008. 40-42 p.

Dealing with Climate Change at the State Level

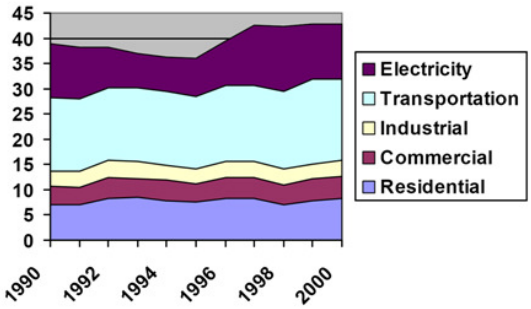
Climate Change Action Plan for Connecticut

The Connecticut Climate Change Action Plan of 2005 was developed by Governor's Steering Committee, which is made up of leaders from key state agencies, including the CT DEP, the Public Utility Commission, the Department of Transportation, Administrative Services, the Office of Policy and Management, and the Connecticut Clean Energy Fund.



CT GHG Emissions by Sector, 2000

The Climate Change Action Plan quantifies the emissions contributing to global climate change that are generated in Connecticut. According to the inventory of greenhouse gas (GHG) emissions for 1990 through 2000:



CT CO2 Emissions from Fossil Fuel Combustion, 1990–2000 (MMT)

- about 90% of the total emissions in 2000 came from the combustion of fossil fuels—oil, gas, and coal—to power the state's cars and factories, heat and cool its homes and buildings, and generate electricity
- Municipal solid waste management was responsible for about 6% of total emissions
- Industrial processes and agriculture contributed less than 2% and 1%, respectively. (See figure entitled, CT GHG Emissions by Sector)

Carbon dioxide (CO_2) emissions from fossil fuel combustion result from stationary sources (i.e., power plants, industrial facilities, and home heating systems) and from mobile sources, such as motor vehicles. The figure entitled, CT CO_2 Emissions from Fossil Fuel Combustion, shows that transportation accounts for approximately 40% of CO_2 emissions annually. Primary energy consumption in the residential and commercial/industrial sectors is approximately 20% and 10%, respectively. The electric utility sector contributes between 18 and 30% of the CO_2 emissions from fossil fuel combustion.[190]

The State's goal is to help reduce greenhouse gas emissions in Connecticut to 1990 levels by 2010, and 10% below that by 2020.[191] Reducing GHG emissions in Connecticut to 1990 levels and lower will require aggressive action by all sectors of society, including its businesses and institutions, colleges and universities, nongovernmental organizations, and local governments. All sectors will play a vital role in focusing attention on climate change in Connecticut and implementing the GHG mitigation actions proposed in this plan.[192] The Plan contains 55

[190] Governor's Steering Committee on Climate Change. January 2005. Connecticut Climate Change Action Plan 2005. 38-41 p.
[191] "Climate Change". Connecticut Department of Environmental Protection. 11 June 2009. <http://www.ct.gov/dep/cwp/view.asp?a=2684&q=322070&depNav_GID=1619>
[192] Governor's Steering Committee on Climate Change. January 2005. Connecticut Climate Change Action Plan 2005. 42 p.

recommended actions that focus on five main topic areas: Transportation and Land Use; Residential, Commercial and Industrial; Agriculture, Forestry and Waste; Electricity Generation; Education and Outreach. The Plan is available on-line at: http://www.ctclimatechange.com/.

Local Alternatives to Combat Climate Change

Of the 55 recommended actions in the Connecticut Climate Change Action Plan 2005, many actions can be implemented at the municipal level. These include:

- Transportation and Land Use:
    - Fleet Vehicle Incentives and Initiatives (acquisition of low-GHG vehicles in public, private and state fleets)
    - Transit, Smart Growth and Vehicles Miles Travelled (VMT) Reduction Package
    - Increase availability of low-GHG transportation choices, such as transit (bus and rail), vanpools, walking and biking. Provide complimentary land use policies and incentives to improve the attractiveness of low GHG travel choices.
    - Redirect at least 25% of new development (forecast population and employment) to growth-appropriate locations, as indicated by the State POCD.
- Residential, Commercial, Industrial:
    - High-Performance Schools and State-Funded Buildings (design new construction and major renovations to meet Leadership in Energy and Environmental Design (LEED) standards)
    - Training of Building Operators (train building operators to maximize efficiency of their buildings and reduce energy use)
    - Energy Benchmarking and Tracking Program for Municipal Buildings (measure and track energy consumption, strategic planning, and benchmarking in comparison to other buildings)
    - Procurement of Environmentally Preferable Services and Products
- Agriculture, Forestry, Waste:
    - Reduce Use of Non-Farm Fertilizer (support education programs to reduce nonfarm (i.e., commercial and residential) fertilizer use by 7.5% by 2010 and 15% by 2020)
    - Buy Locally Grown Food (local produce reduces emissions associated with the transport of agricultural products; purchase an additional 10% of CT's farm products from local sources instead of conventional markets)
    - Urban Tree Planting Program
    - Plant trees in urban areas to reduce the consumption of energy for heating and cooling buildings, thereby helping avoid fossil fuel emissions and increasing the carbon stock of non-forest land.
    - Establish an urban forestry program (CT DEP provides funding and other support for urban forestry programs and tree planting).
    - Forest and Agricultural Land Preservation (support the protection of forestland and agricultural land preserves for their carbon absorption/sequestration capacity)

  - Increase Recycling and Source Reduction
- Electricity Generation:
  - Government Clean Energy Purchase (see below)
- Education and Outreach:
  - Support state efforts to foster a broad awareness of climate change issues (including co-benefits) and impacts and engage citizens in actions to reduce GHG emissions
  - Lead by example (e.g. make municipal events "green" with environmentally preferable products, recycling containers, locally grown food, etc.; reduce municipal fertilizer use)

Dealing with Climate Change Locally

State & Voluntary Programs

The Connecticut Governor's Steering Committee on Climate Change also recommends that cities and towns develop local climate change action plans. Eighteen municipalities have pledged to reduce greenhouse gas emissions: Bridgeport, Fairfield, Hamden, Hartford, New Britain, New Haven, Plainville, Stamford, Weston, Windham, and Windsor. Bristol, New Britain, Berlin, Burlington, Plainville, Plymouth, and Southington have also made the pledge through the Central Connecticut Regional Planning Agency. All of these communities also joined Cities for Climate Protection, a program run by the International Council for Local Environmental Initiatives. Information about this program is available at: http://www.iclei.org/index.php?id=1854 for more information

Enfield Clean Energy Committee

Enfield participates in the Connecticut Clean Energy Fund (CCEF), which was created in 2000 by the Connecticut Legislature to support clean energy. In October 2007, the Town Council approved a Resolution Proposing Clean Energy Commitment and Creating a Clean Energy Committee. According to the resolution: with a commitment to the health of its citizens, the Town of Enfield commits to the CCEF "20% by 2010" campaign, where, by the year 2010, the Town's municipal facilities will purchase 20% of energy needs from clean energy sources and will allocate 100% of any electricity savings to additional town purchases of clean energy.

A Clean Energy Committee was also created by the resolution for the purpose of promoting clean power options, encouraging the development of renewable energy in Enfield; and making recommendations to the Town Council for purposes of achieving the Town's goals stated in the resolution.

Enfield's Clean Energy Committee was established in 2007. The committee researches opportunities for clean energy purchase, renewable energy, and funding and provides recommendations to the Town Council. The committee also networks with other municipalities and organizations to learn what has worked in other communities. The committee is working with the town to establish the town's baseline energy use and recommends that the town participate in the EPA Community Energy Challenge.

Economic Incentives for Energy Conservation

As part of the CCEF, if Enfield further commits to the EPA Community Energy Challenge, the town can qualify for (1) free solar power systems by making significant commitments to clean

energy and (2) $5,000 Community Innovations Grants to fund programs designed to raise awareness of the benefits and availability of clean energy on the local level.

Energy efficiency not only reduces GHG emissions, but also saves money. The EPA Community Energy Challenge is an opportunity for municipalities across New England to identify simple and cost-effective measures that increase energy efficiency and renewable energy use while reducing air pollution and saving money.[193] Communities must set a target for reductions (at least 10% lower than the community's baseline) in energy use intensity (energy use per square foot) and then track energy use, costs and greenhouse gas emissions. The timeframe for reductions is up to participants. The EPA and its program partners provide resources to identify opportunities for energy efficiency and renewable energy sources. Thirty-three cities and town in Connecticut have already joined the challenge.

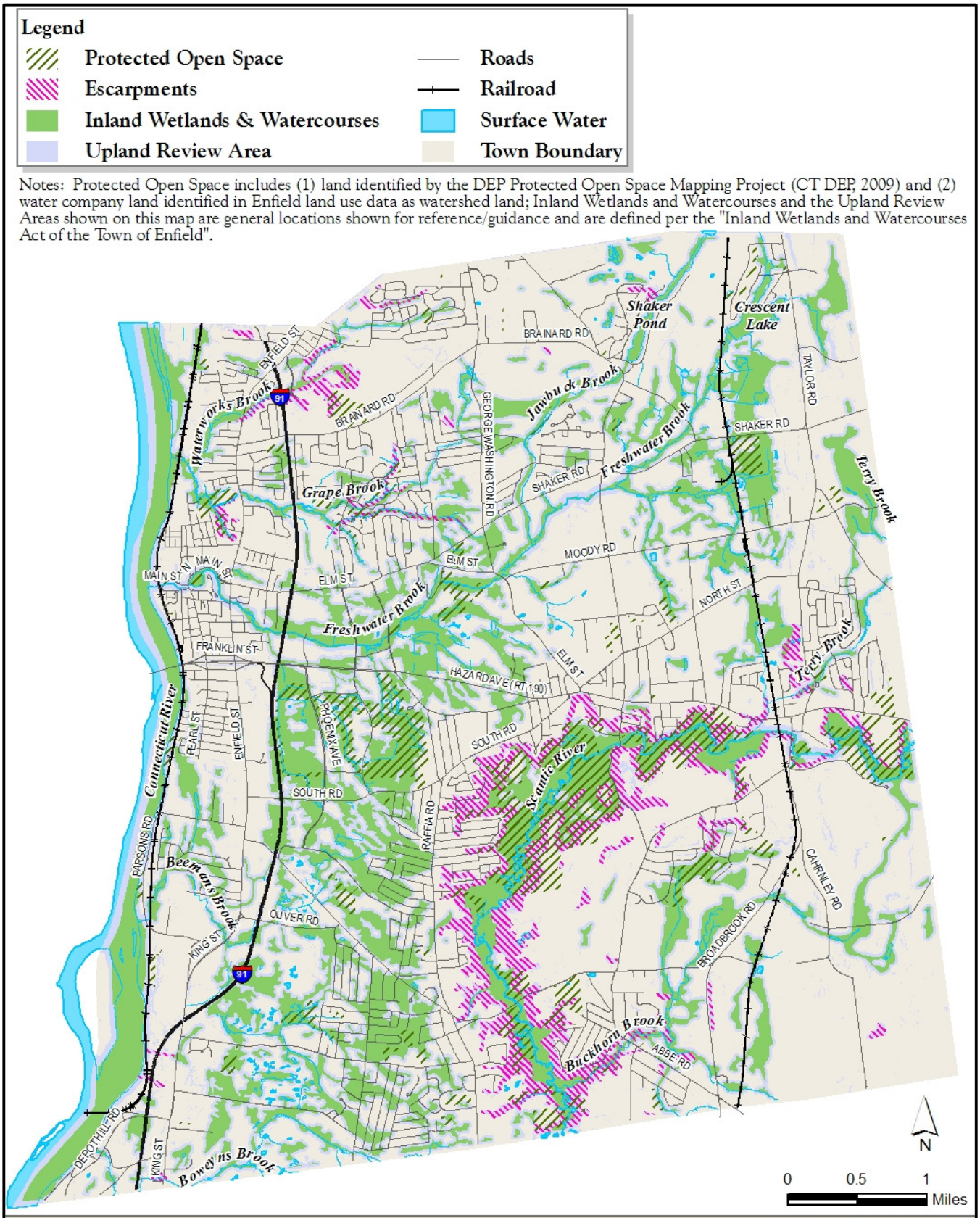
Findings

- The town's "Aquifer Protection Area Regulations" have been adopted as the town's aquifer protection area land use regulations, consistent with state regulations. However, even though the CT DEP lists agricultural and residential land uses as principal groundwater concerns, these activities are not regulated by the state or local Aquifer Protection Area regulations.
- Enfield has experienced on-going erosion problems, particularly of the terrace escarpment soils. More sustainable methods of stormwater management, such as on-site bioretention, constructed wetlands and permeable paving, as well as the preservation/restoration of wetlands and floodplain areas can help address the causes of erosion and flooding problems. The CT DEP's "Stormwater Quality Manual" provides guidance on measures to protect waters from the adverse impacts of post-construction stormwater runoff, including retrofitting of older stormwater systems.
- One important element of this permit is the requirement that towns implement public education programs to make residents aware that stormwater pollutants emanate from many of their everyday living activities, and to inform them of steps they can take to reduce pollutants in stormwater runoff.
- The CT DEP has assessed several surface water segments in Enfield for water quality and listed these water bodies on the Impaired Waters list, including the Connecticut River, Scantic River, Freshwater Brook and Buckhorn Brook. The Connecticut River and Buckhorn Brook are classified as not supporting recreational use, and TMDL studies have been given a high priority. Per the CWA, all water bodies identified on the Impaired Waters list must attain water quality standards within a reasonable period, either through a Total Maximum Daily Load (TMDL) study (Water Cleanup Plan) or other pollution control mechanisms. The impairments to the Connecticut River and Buckhorn Brook are being studied for possible development of TMDL.
- General sources of contamination with the potential to impact to Enfield's drinking water wellfields include properties with underground fuel storage tanks, improperly maintained on-site septic systems, improper waste disposal, or commercial/industrial sites that store or use chemicals or generate hazardous wastes.

[193] "Community Energy Challenge: Promoting Energy Efficiency and Renewables in New England Cities and Towns". US Environmental Protection Agency. 4 August 2009. <http://www.epa.gov/Region1/eco/energy/energy-challenge.html>

- The wellfield with the highest susceptibility is the O'Bready Wellfield, located north of Hazardville. Some of the conditions that contribute to its high overall susceptibility rating include: levels of several contaminants that exceed federal and state maximum contaminant/guidance levels; a contaminant release point within the source water area; commercial or industrial development of ten percent or more of the source water area; and very little or no public/private preserved open space lands within the source water area.
- According to Enfield's Source Water Assessment, a potential risk factor common to most of the source water areas is that more than 30% of the land (in 2003) is undeveloped, which could present a risk if developed inappropriately. Additionally, less than 10% of the land in the source water areas exists as preserved open space.
- Efforts to protect and improve groundwater quality focus on protection of the source water supply, which includes land use regulation and land conservation. Land conservation can also offer long-term cost savings over mitigating water quality problems.
- Decisions about land use over the next several decades will be particularly significant since nearly 87% of the land within Enfield's aquifer protection areas is currently unprotected and 19% of this is vacant or unprotected open space susceptible to development. Seventy percent is already developed with commercial, industrial, institutional, residential or agricultural land uses.
- Historically, wetlands have been undervalued because their benefits and environmental functions were not well understood. Wetlands perform valuable ecological functions: they remove nutrients, pollutants and sediments from surface water runoff; recharge water supplies; reduce shoreline erosion and flood risks; and provide fish and wildlife habitat. In addition, wetlands provide recreational opportunities, aesthetic benefits, sites for research and education, and commercial fishery benefits.
- In Enfield, freshwater wetlands are regulated through the "Inland Wetlands and Watercourses Regulations of the Town of Enfield", consistent with state requirements. The regulations require a permit for all "regulated activity" within the wetlands and watercourses and an associated upland review area. In general, the applicant must demonstrate that his application is consistent with the purposes and policies of the regulations and that a feasible and prudent alternative does not exist.
- In Enfield, approximately 5,160 acres (or 23% of the town) are classified as inland wetlands or watercourses. Additionally, approximately 6,260 acres (or an additional 28% of the town) falls within the upland review area.
- In addition to government regulation, some of the best protection for wetlands has been provided through acquisition and conservation easements by private and public land protection programs. Approximately 722 acres, or 14% of the inland wetlands and watercourses in Enfield, fall within protected open spaces; however, they can still be affected by land use activities within the open spaces as well as by adjacent land uses.
- Approximately 90% of the agricultural land use in the town occurs on land considered prime farmland or farmland of statewide importance.
- 823 Ac or 21% of the agricultural land use in Enfield occurs on land designated as preserved farmland.

- CT DEP's Natural Diversity Database (NDDB) maps represent approximate locations of endangered, threatened and special concern species and significant natural communities. CT DEP may have to be contacted for guidance if a project meets one or more criteria.
- Connecticut has established a goal of protecting 21% of the state's land areas (673,210 acres) by 2023. Of this 21%, 10% is targeted to be acquired and held by the state and 11% is targeted to be acquired and held by land protection partners.
- There are 1,574 acres of protected open space in Enfield (7% of the town). The CT DEP owns 21% of this protected open space and the remaining 79% is protected through partners (Town of Enfield, Northern Connecticut Land Trust, water companies, etc.). To achieve 21% protected open space within Enfield by 2023, approximately 3,150 additional acres would need protection (although the 21% is a statewide goal and may not be dispersed equally throughout the state's municipalities).
- Connecticut has pledged to reduce the state's greenhouse gas emissions to 1990 levels by 2010 and 10% below that by 2020, which will require aggressive action by all sectors of society, including local governments.
- The Connecticut Climate Change Action Plan 2005 details 55 recommended actions, many of which can be implemented at the municipal level, to help the state reach its GHG reduction targets. These are summarized on the previous pages.
- The Clean Energy Committee can help the town research and implement GHG reduction actions, educate the public and promote Enfield's role in mitigating climate change.
- The Enfield Clean Energy Committee supports the town's participation in the EPA Community Energy Challenge, which can save the town money through energy savings and help the state meet its GHG reduction goals.
- Protection/Improvement Efforts: Efforts to protect and improve surface water quality focus on the reduction of non-point source pollutants, municipal wastewater discharges and coordinated watershed efforts.
- As non-point source pollution is inextricably tied to local land use, many related water quality problems can, and should, be addressed locally through land use planning, education and, where appropriate, regulation.



Inland Wetlands and Watercourses

Plan of Conservation & Development - Town of Enfield, CT

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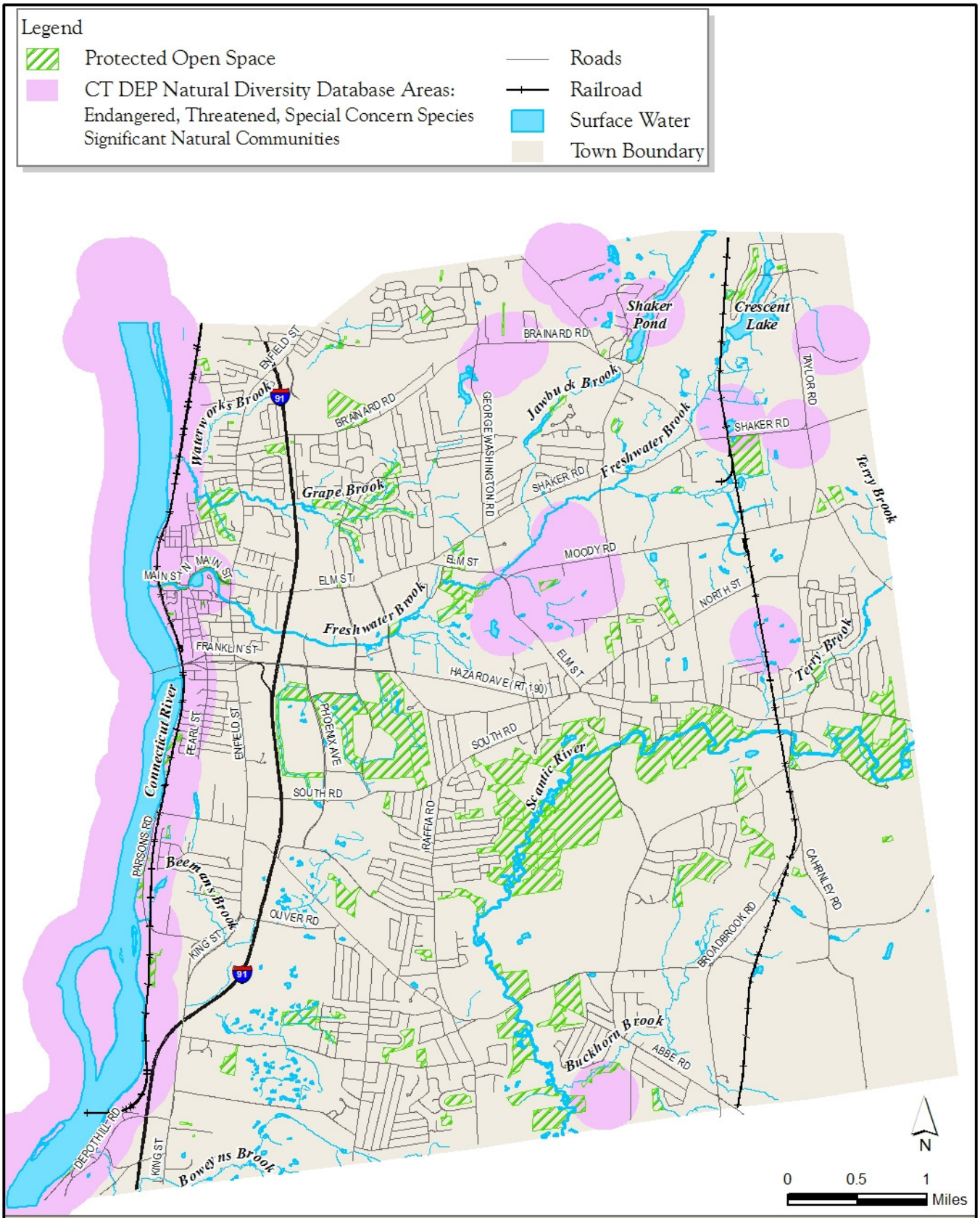

Natural Diversity - Areas of Concern

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Legend

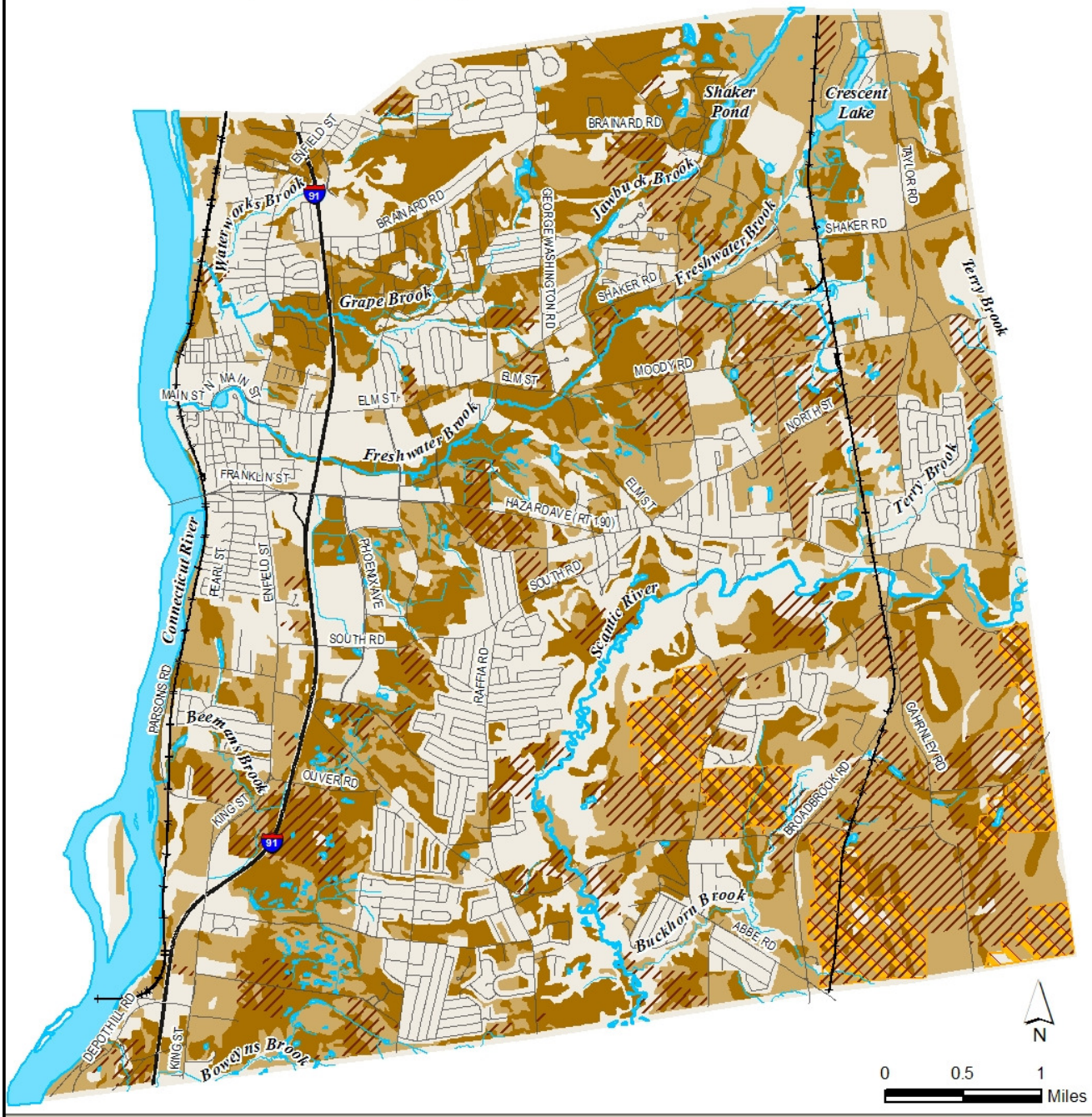
Soils

- Farmland of Statewide Importance
- Prime Farmland

- Agricultural Land Use
- Preserved Farmland

- Roads
- Railroad
- Surface Water
- Town Boundary

Note: Farmland Preservation Property includes parcels of land that are designated as preserved farmland under the Connecticut Farmland Preservation Act (CT DEP and DOAG, 2009).



Farmland

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